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Ref: 8EPR-PS

JAN 17 2001

MEMORANDUM

SUBJECT: Revised Sampling and Analysis Plan for Richardson Flats

FROM: Susan Griffin, PhD, DABT
Regional Toxicologist

TO: Jim Christianson
Remedial Project Manager

At your request I have reviewed the revised Sampling and Analysis Plan for Richardson Flats dated January 9, 2001. Overall, the document is a vast improvement over the previous versions. The revised plan clearly describes the human and ecological receptors who may be exposed to contaminated media at the site and how the sampling will characterize exposure to those receptors. Other objectives of the site investigation, such as defining nature and extent, were also clearly articulated. Most of my comments are relatively minor, however, I still had some concerns about the location of the off-site and background soil sampling, the actual effort which was going to be put into clarifying off-site groundwater usage, and the human health pathways which are to be quantitatively evaluated for risk. My comments are as follows:

1. Page 22, Section 2.2.4.14, Summary of Potentially Complete Exposure Pathways

This section summarizes pathways of concern for human and ecological receptors, however the list presented appears to be inconsistent with the preceding text. Direct contact with the soils/tailings impoundment and off-site use of groundwater were discussed as complete pathways in sections 2.2.4.9 and 2.2.4.10, and should be added to the list here.

2. Page 23, Surface Water and Sediments

The evaluation of human health should be added to bullet #1 in this section as a use of the data.

3. Page 23, Groundwater

Section 2.2.4.10 does a very good job of describing what we know about off-site use of groundwater (which is nothing!) and what type of data we need to collect to fill that data gap. Yet the remedial objectives for groundwater on page 23, include none of that discussion. A primary objective for groundwater should be conducting a well water survey of homes, ranches, etc downgradient of the site to determine if there is any current use. Following that, a determination of the water quality would be in order.

4. Page28, Section3.1.3

The SAP proposes to analyze all onsite soils for lead and arsenic, and only 20% of the soils for other metals. Depending on what is found in those 20%, additional metal analyses on more samples may be necessary. I would suggest that the soil samples be archived, until such a determination is made.

In Figure 5, sampling locations are shown for the main impoundment, but not for the tailings outside the impoundment. It is unclear to me why no samples are being collected there. Is this not an area where on site workers, future recreationalists, or ecological receptors could be exposed? If it is not, then rationale should be provided in the text as to why it is not.

5. Page 29, Section 3.1.3.1, Off-site Soil sampling

In Figure 7, the wind rose shows predominant wind directions as Northwest and Southeast. Yet in Figure 6, the off-site soil samples are directly north and south of the site. I have to wonder how much value these off-site sampling locations will be in addressing the issue of contaminated material blown off of the site.

6. Page 32, Section 3.1.6, Background Soils Samples

The location of the proposed background soil samples are shown in Figure 2. The authors may want to rethink some of these sample locations, particularly the ones which are only 500 - 1000 ft away from and in the same wind direction as the off-site soil sample locations. To be credible, background samples should be collected from areas which have not been impacted by site processes. Some of these proposed background locations don't appear to be that much different than the areas being sampled for wind-blown contamination off-site. Also, depending on the results of the analysis, more that 20% of the samples may need to be analyzed for all metals. I would suggest archiving the samples until such a determination has been made.

7. Page 34, Section 3.2.3, Soils

The last sentence states that since human health risk is expected to be low, the samples will not be sieved. This is not exactly correct. In the past, EPA has requested that samples be sieved at residential sites because small children come into contact with soil by placing their hands, toys, or food in the soil, and then placing those in their mouths. Typically the smaller particle

sizes of the soil adhere to hands, toys, etc and that is the fraction that we are interested in analyzing for metals. If residential land use is not expected at this site, and exposure to human receptors is thought to be minimal, then the need for sieving is less important. I would suggest that the sentence be revised to explain that sieving of the soil to smaller particle sizes is not being done because residential land use is not expected at this site.

8. Figure 8A, 8B Site Conceptual Model

- Exposure to the soil cover by site visitors (current or future) should be shown as a complete pathway to be consistent with the text in Section 2.2.4.9.
- Exposure to sediments and surface water should be complete pathways to off-site receptors (human), to be consistent with the text in Section 2.2.4.5.
- This is a small point, but, the use of the less significant unfilled circles to represent complete human health pathways gives the impression that we are dismissing the importance of these pathways before the data is in. I would prefer to see all potentially complete exposure pathways represented as filled circles.